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ABSTRACT

In order to identify the relationship among social support networks, depression, life events, and student progress in medical school, 96 students completed a questionnaire. The results indicated good social support, a high number of recent life events, slight depression and a continuum of not quite passing to doing extremely well in medical school. The combination of variables from a step-wise regression analysis which best accounted for student performance were the depression scores, distance from home of origin, and life events. Data from this study can be used with potentially vulnerable students to avoid academic difficulty. (Author)

PREDICTING STUDENT SUCCESS FROM NON-COGNITIVE VARIABLES

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Paper delivered at the Annual Meeting of the American Educational Association in New Orleans, Louisiana, April 1984.

In order to identify the relationship among social support networks, depression, life events and student progress in medical school, 96 students completed a questionnaire. The results indicated good social support, a high number of recent life events, slight depression and a continuum of not quite passing to doing extremely well in medical school. The combination of variables from a step-wise regression analysis which best accounted for student performance were the depression scores, distance from home of origin and life events. Data from this study can be used with potentially vulnerable students to avoid academic difficulty.

Success in medical school is usually predicted by previous academic performance. An index which considers undergraduates' grades and scores on the Medical College Admission Test correlates about .40 with academic success, particularly in the first two years as measured on multiple choice questions (McGuire, 1977). Clearly, other factors are contributing to variance in student success. This paper will identify some of these other factors which contribute to academic success.

The authors of this paper have observed that those students who elect to drop out of medical school rarely do so exclusively for academic reasons. Research indicates that psycho-social factors which could account for some of this variance are social support networks, changes in life events, and depression.

The environment plays an enormous role in facilitating or inhibiting student progress. That medical school is stressful for the students has been well documented (e.g., Becker, 1961, Coombs, 1978). Sources of medical student stress include the amount of material to be learned, responsibilities required, dehumanization of students, ambiguity of the environment and the status of the students. Yet some students experience more stress than others. Most medical school faculty recognize the close relationship between stress and depression. Since stress is a hypothetical construct and is difficult to measure directly, it is more practical to measure depression in medical students, and infer stress.

Literature on stress-related disorders have developed non-linear models involving variables mediating between stressful stimuli and deleterious or adaptive responses to such experiences

(Barrett, 1979 and Rosch, 1979). Antonovsky (1979) labeled these adaptive responses as "resistance resources". Social support is one commonly hypothesized resistance resource in preventing or reducing the effects of stress-related illness. Numerous studies (e.g. Barrett, 1979, and Antonovsky, 1979) illustrate the effects of strong or weak social support on general and selected populations. Social support networks, which are composed of an individual's refence groups, are an important determinant of achievement (Kemper, 1968) and provide emotional or affective support (Caplan, 1979). Such groups provide norms, values, role models, legitimate action and create pressure for achievement (Kemper, 1968).

Although little research has systematically studied social support in medical student populations, its influence on students' well being has been raised by several investigators. On the negative side, Edwards & Zimet (1979) report that 62% of medical students surveyed report "lack of time for family and intimate friends" as one of their major concerns, ranking second among their most significant concerns in medical school. Relative social isolation of students, particularly women and minorities, and poor medical student - faculty relationships have resulted in emotional instability and dysfunctional stress reactions (Gaensbauer & Mizner, 1980, and Huebner, et al., 1981). Social support networks seem to have an independent positive effect in addition to that of buffering stress (Warheit, 1979). A "student culture" provides collective protection and relief from the stresses of their student experiences (Miller, 1961). It is not surprising

that Staryhorn (1980) found that medical students reported greater support from fellow students than from faculty and administrators. Yet the support from faculty has been experimentally increased. Gardner (1982) found that a group of first year medical students who received a small amount of social support from a faculty member weekly for a year felt less stressed and viewed the faculty's control as less of a danger than groups of similar students who had not received this experimentally manipulated nurturance from the faculty.

Objectives

In this study relative success in medical school is believed to be influenced by stressful stimuli both constant to medical students and individual-specffic, the amount of perceived depression and the resistance resource of social support. The individual-specific stressful stimuli are measured by stressful life events. Thus the research objectives are:

1) To describe, compare and contrast the nature of the social support networks of medical students.
2) To identify the influence of life events, perceived depression and social support networks on the progress of students through medical school.
3) To identify relationships among social support networks, depression, life events, demographic variables and student progress in medical school.

Hypotheses

1) Strong social support networks will be positively correlated with academic success in medical school.

2) High depression scores will be correlated with poor academic progress in medical school.

3) Knowledge of individual student's socioeconomic status, social support networks, life events, percieved depression and other demographic data, will be useful in predicting success in medical school.

Methods

Procedure

Each third year medical student was assigned an identication number, and the questionnaires were coded with this number, no names were on the forms. In the spring of their third year, questionnaires were sent to the entire class and were asked to complete them. They were told that their responses would be anonymous; only group results would be reported. After a month follow up requests were sent to those who had not responded. All of the scales on the questionnaire were scored according to the standard procedures.

After the participants' class had graduated from medical school, the authors completed the Student Progress Rating Report for each participant. Information was gathered from college files, and data provided by the participants. This report reflects progress during all four years of school.

The relationships among the variables were examined through Pearson Product Moment Correlations and Point Biserial Correlations. Stepwise multiple regression analyses, and forward model multiple regression analyses were conducted to test for the predictions concerning academic success.

Instruments

The questionnaire sent to the participants consisted of several parts: the Social Support Networks Inventory (Flaherty, et al., 1983), the Social Readjustment Rating Scale (Holmes & Rahe, 1967), the Zung Self-Rating Depression Scale (Zung, 1965), and demographic questions. The zung depression scale was used as the measure of psychological well being since previous research shows it to be correlated with anxiety and general psychological health in these students (Blumberg, et al., 1984).

The Social Support Networks Inventory first has subjects list the members of their social network who are currently a source of support; for each member, basic demographic data is collected (age, race, sex, occupation and relationship to the student). Then subjects answer eleven questions related to key aspects of support regarding each of their first five network members. Each of the answers to each question are scaled from 1 to 5, with 5 indicating maximal support. The eleven questions relate to five major aspects of social support: closeness and availability, practical support, emotional support, reciprocity and specific event related support. This Social Support Network Inventory has been field tested and shown to have test-retest reliability, convergent and divergent validity and high internal consistency for the basic 11 questions (alpha coefficient = .841) (Flaherty, et al., 1983).

The Student Progress Rating Report was developed and validated by the authors (Blumberg, et al., 1982). The report consists of 34 indicators of medical student progress including

positive and negative academic and psychosocial markers. During the development of the report students and faculty were asked to rank each indicator on a scale from -10 to +10, with the higher the absolute number the greater the importance. Each indicator was assigned a weight which was the mean of the values ranked by the validating students and faculty. For example, failing National Board Part I was worth -7, and receiving an outstanding grade on a clerkship was worth +6. For each indicator, a point assignment was made which was the weight multiplied by the frequency of occurrence. The total number of points were summed for each student. Subscores were also obtained for total positive, total negative, total academic and total psychosocial indicators.

Data Source

Students in the third year class of a large, metropolitan college of medicine were asked to participate. This class was chosen because these students appeared to be in a relatively stable time in their medical student career. Since these students had completed most of their required clerkships, they were familiar with their roles in the hospital. Also they were not preparing for major examinations, and were not anticipating major changes in their student-related responsibilities in the near future. Ninety-six (64%) of the students surveyed completed the questionnaires. Since the demographic characteristics reflect the total class, this sample is representative of the population. Eighty-seven percent of the respondents were White; Asians, Blacks and Hispanics were four percent each. The mean socio-economic level of the respondents was 2.2 on the Hollingshead and Redlich five class system (1968), with the distribution skewed

toward the higher socioeconomic strata. Eighty-eight percent of the participants grew up within a 50 mile radius of Chicago where this school is located. Eighteen of the respondents were females.

Results

Social Support Network. The mean number of network members listed by the students is 7.88. A typical support network includes both parents, a sibling, a close "girl/boy-friend" or spouse and another close friend. Less frequently students listed faculty, administrators, clergy, grandparents or other relatives. On the average networks consisted of 17.3% medical students and 7.04% physicians (mostly faculty or house staff). Students had known each network member for an average of 14.11 years. A mean social support score was calculated for each student from the Social Support Network Inventory responses. The score is the average of 55 responses (i.e. questions x 5 network members); for each response 5 indicated maximum support and 1 indicated no support. The mean support for these students was 3.98, which is comparable to general populations surveyed and significantly higher than psychiatric populations (Flaherty, et al., 1983).

Life Event Changes. These students experience a fairly high number of life event changes ($\bar{X}$ = 135.69, S.D. = 95.7, possible range 0-470). Previous research indicates that adults who have scores over 200 have greater frequencies of physical and psychiatric problems than people with scores lower than 200.

Depression Scores. The Zung scores indicate that these students are slightly but not statistically significantly more depressed than the general population ($\bar{X}$ = 39.52, S.D. = 10.8, the normal validating sample had a mean of 33 and a range of 25-43).

Student Progress Rating Report. The mean score on the Student Progress Rating Report was 23.726 and a standard deviation of 15.216, with a range from -21 to +72. Thus reflecting the continuum of not quite passing to doing extremely well in medical school.

Table 1 shows the Pearson Product Moment Correlations for the continuous variables and Point Biserial Correlations for the continuous variables and sex. Hypothesis 1 was confirmed since the correlation of academic progress in medical school with social support was $r = .24$, $p < .05$. Hypothesis 2 was also confirmed since the correlation of academic progress in medical students with depression was $r = -.24$, $p < .05$. (For the depression scores, the higher the score the more depression.)

Multiple regression analyses were performed using the student Progress Rating Report as the dependent variable, and socioeconomic status, sex, social support network, life events, Zung depression and distance from home of origin as the independent variables. The combination of variables from a step-wise multiple regression analysis which best accounted for student success were in decreasing order of importance: Zung Depression Score ($F = 3.383$, $p < .05$), distance from home of origin ($F = 3.51$, $p < .05$) and life events ($F = 3.39$, $p < .05$). No other variables met the 0.10 significance level for entry into the

model. Table 2 shows the complete step-wise regression analysis. In order to test how much social support and socioeconomic status contributed to success in medical school, forward, fixed multiple regression analysis was conducted using these two variables as the first two to be considered in the model. Social support showed a contribution to academic success ($F = 3.77$, $p < .05$), but socio-economic status did not contribute ($F = 0.28$, $p > .05$). Aspects of hypothesis 3 were confirmed in that measures of psychological well being, life events and one specific demographic characteristic, i.e., proximity to home, are useful in predicting success in medical school. Socioeconomic status and other demographic data did not influence success in medical school. The measure of social support played a minor role in this prediction.

Discussion

The constellation of variables of depression, distance from home of origin, life events and social support, when taken together, seem to explain some of the previously unexplained variance in prediction of success in medical school. These variables have practical implications for facilitating student success. Distance from home of origin may be seen as an indirect measure of social support. Since most of the students listed their parents in their primary social support network, being geographically close to one's parents may help students to relieve stress. Some of the students still lived with their parents and being in a regular home environment may be less stressful than living alone. Family members may relieve stress

by listening to students and encouraging them. Students living at home may also have fewer housekeeping responsibilities and financial worries. Students who can go home easily may be able to reduce their stress by being in a non-academic environment and having relaxing times with old friends and family. Students who are in school far away from their home of origin may not have these stress reduction outlets available to them.

In addition to considering students with weaker academic records, administrators and advisors might identify and try to devote extra time to students who seem depressed, are currently far away from their home of origin, who have had many life events recently or have inadequate social support networks. These potentially vulnerable students may be easily identified prior to getting into academic difficulty. Inadequate social supports can be assessed in the initial advisor-student interview or can be assessed for the entire class by using a quantitative instrument such as the Social Support Network Inventory (Flaherty, et al., 1983). Measures of depression and life events are easy to administer to all students periodically.

But administrators and faculty should not stop with administering these instruments. They should work toward having closer personal contact with their students. The reasons for this are: 1) to confirm the results of the written tests, and 2) to increase the social support among students. Administrators and faculty can facilitate greater social support many ways including strengthening the advisory system, establishing support groups, encouraging socializing with the students, and increasing one-to-one faculty-student encounters in non-threatening situations.

Perhaps this can help potentially vulnerable students to avoid academic difficulty. Finally, this research points to the complexity in predicting success in medical school and the continued need for more work in this area.

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PB:sjo

TABLE 1

Pearson and Biseral Correlation Coefficients for Major Variables Third Year Medical Students (N = 96)

		SEX	SES	SSN	LIFE	ZUNG	HOME	ACAD	PSYCH	STUDENT
SEX	r	1.00000	-0.07201	-0.05544	-0.03881	-0.08680	-0.07767	0.05728	0.07490	0.06511
	p	0.0000	0.5151	0.6165	0.7276	0.4324	0.4935	0.6048	0.4983	0.5562
SOCIOECONOMIC STATUS (SES)	r		1.00000	-0.06547	-0.02499	0.21156	0.16066	-0.5332	-0.03979	-0.06310
	p		0.0000	0.5541	0.8225	0.0534	0.1546	0.6300	0.7193	0.5685
SOCIAL SUPPORT NETWORK (SSN)	r			1.00000	0.02512	-0.38778	0.11927	0.23849	-0.02611	0.19300
	p			0.0000	0.8217	0.0003	0.2920	0.0227	0.8136	0.0786
LIFE EVENTS (LIFE)	r				1.00000	0.30752	-0.09193	0.09626	0.01973	0.10086
	p				0.0000	0.0047	0.4204	0.3866	0.8595	0.3643
ZUNG	r					1.00000	-0.01589	-0.24239	-0.10409	-0.23920
	p					0.0000	0.8887	0.0263	0.3461	0.0284
HOME ORIGIN (HOME)	r						1.00000	0.27642	-0.04011	0.1963
	p						0.0000	0.0131	0.7239	0.081
ACADEMIC INDICATORS (ACAD)	r							1.00000	0.19978	0.93117
	p							0.0000	0.0685	0.0001
PSYCHOSOCIAL INDICATORS (PSYCH)	r								1.00000	0.41023
	p								0.0000	0.0001
STUDENT PROGRESS RATING REPORT (STUDENT)	r									1.00000
	p									0.0000

TABLE 2

Stepwise Multiple Regression for Student Progress Rating

Source	df	SS	MS	F	p	R^2
Zung	1	996.480	996.480	3.83	$p<.05$	.048
Distance from home of origin, Zung	2	1777.222	888.611	3.51	$p<.05$	.086
Life events/home, Zung	3	1507.148	835.715	3.39	$p<.05$	.121
Error	74	18264.700	246.820			
TOTAL	77	20771.846				